

INFORMATION REPORT INFORMATION REPORT

CENTRAL INTELLIGENCE AGENCY

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C-O-N-F-I-D-E-N-T-I-A-L

50X1-HUM

COUNTRY USSR

REPORT

SUBJECT Stupino, Dnepropetrovsk, Zaporozhye,
and Penza Power Plants

DATE DISTR. 26 August 1960

NO. PAGES 1

REQUIREMENT NO.

50X1-HUM

REFERENCES

DATE OF INFO.

PLACE & DATE ACQ.

SOURCE EVALUATIONS ARE DEFINITIVE. APPRAISAL OF COUNTRY

50X1-HUM

1. TETs Power Plant No. 2 in Penza, located within the territory of the machinery-railroad car construction plant, supplied power only to the above-mentioned plant and was subordinate to a Ministry of Machine Building (sic).

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the machinery-railroad car construction plant was a restricted armament plant. This station had a maximum capacity of 24,000 kilowatts per hour. The fuel was coal, requiring approximately 300 grams of fuel to produce one **kilowatt** (depending upon the quality of coal). The plant employed about 150 people.

2. Three reports on power plants in Penza (TETs 1 and 2), Dnepropetrovsk and Zaporozhye, and Stupino, with sketches locating the plants,

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STATE	X	ARMY	#	X	NAVY	X	AIR	15	SEC	NTC	X	AEC	NSA	X	ORR/EV	X
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COUNTRY USSR

REPORT

50X1-HUM

SUBJECT Stupino, Dnepropetrovsk, Zaporozhye, and Penza Power Plants

DATE DISTR. 26 August 1960

NO. PAGES 1

REQUIREMENT NO. RD SP-1003
RDC-2065

REFERENCES

DATE OF INFO.

PLACE & DATE ACQ.

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SOURCE EVALUATIONS ARE DEFINITIVE. APPROVAL OF SOURCE

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2. Three reports on power plants in Penza (TETs 1 and 2), Dnepropetrovsk and Zaporozhye, and Stupino, with sketches locating the plants.

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INFORMATION REPORT INFORMATION REPORT

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COUNTRY: **USSR (Penzenskaya
oblast)**
SUBJECT:

REPORT

DATE OF

DATE A

DATE OF REPORT:

27 July 1960

PLACE ACQUIRED:

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Penza Power Plants

PENZA POWER PLANTS

- I. In 1954 or 1955 [redacted] installation of a 25,000 kilowatt steam turbine in TETs No. 1, Penza. Another 25,000 kilowatt steam turbine was installed in the same power plant in 1956, and during [redacted] the installation of two steam turbines, each of 12,000 kilowatt capacity in TETs No. 2, located inside the new machinery and railroad car construction plant in Penza. There were three thermal electric stations in the city of Penza [redacted]
[redacted] 50X1-HUM
2. Refer to page 6 , showing [redacted] sketch of the two TETs installations. The following legend identifies numerical designations:
 - (1) Railroad lines (reference point).
 - (2) Main railroad station (reference point).

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- (3) Branch railroad station, (reference point).
- (4) Machinery and railroad car construction plant. This plant was located about three kilometers east of the main railroad station and two-three kilometers north of the Sura River. This was a new plant, the construction of which was finished in 1955 or 1956. [redacted] it manufactured lathes, milling and drilling machinery and railroad cars. [redacted]
- (5) TETs No. 2 located inside the machinery-railroad car construction plant.
- a. This was a one-story, brick building, about 50 meters square and 30-35 meters in height.
 - b. Smokestack, about eight meters in diameter and 80 meters in height.
 - c. Two cooling towers, about 20 meters in diameter and 60 meters in height.
- (6) TETs No. 1. (details below). This power plant was on the eastern outskirts of Penza, three kilometers north of the Sura River. The plant area was about one kilometer square and contained no cooling basin or towers. A dam constructed on the Sura River provided the location for a cooling system. The power plant was in a large, one-story brick building, about 100 x 50 meters in area dimension and 35 meters in height, which housed the turbines, boilers and auxiliary equipment. The front section of the building contained administrative-technical offices.
- (7) Town of Penza.
- (8) New settlement for TETs No. 1 employees only, constructed in 1954-1955.
- (9) River Sura.

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TETs No. 1

3. TETs No. 1 was subordinate to the Ministry of Electric Power Stations, and employed 300-400 workers. It was constructed originally to supply power for the Penza Clock Plant, but later (date unknown) the plant became a TETs station integrated within the Penza city electric power system. Prior to 1954 the plant's total maximum capacity (sic) was 24,000 kilowatts per hour. This was increased in 1954-55 to 49,000 kilowatts per hour, and to 74,000 kilowatts per hour in October 1956. [redacted] installation of a new 50,000 kilowatt turbine in this plant was planned for 1957, which would boost the maximum hourly kilowatt capacity to 124,000 kilowatts. 50X1-HUM
4. TETs No. 1 used coal as fuel, and [redacted] 500 grams of coal were required to produce one kilowatt of electricity (depending upon the quality of the coal). The current was distributed at 50 kilovolts. 50X1-HUM

Costs

5. [redacted] 50X1-HUM
- [redacted] the amount charged by the TsentroEnergoMontazhTrest for the installation of a 25,000 kilowatt steam turbine would be approximately 1,000,000 rubles (turbine installation - 200,000 rubles; boiler, generator, transformer and auxiliary equipment installation - 800,000 rubles.) This figure was further estimated in the following cost percentages: materials (pipe, steel, assembly fixtures excluding turbine, boiler, generator and transformer costs) - 60 percent; wages - 22 percent; profit - 18 percent.
6. In 1956 the cost of electric power produced by TETs No. 1 per kilowatt hour was seven and one-half kopeyki (0.075 rubles). The power plant charged the Penza Power System nine kopeyki per kilowatt hour, and the system, in turn, charged its consumers 11 kopeyki per kilowatt hour. In 1948 the power plant sales price was 13 kopeyki; in 1950, 12 or 11 kopeyki; in 1953, 10 kopeyki; and it was envisaged that the initial sales price would be reduced to seven or seven and one-half kopeyki by 1960. The base cost in 1956 was broken down into: fuel - 40 percent; amortization - 20 percent (amortization was

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figured on 20 years, and this cost figure declined each year); personnel, wages - 10 percent; materials - 20 percent; and water cooling, transmission lines, miscellaneous - 10 percent.

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Operational Data

7. The coefficient of efficiency (koeffitsient pelezhnogo deystviya) was 30-34 percent for the entire power plant; for the turbine - 85 percent; for the boilers - 89-94 percent; for the generator 85 percent. The economical overall output of a possible 100 percent maximum output was 82 percent. About one-half to one percent was considered as the average percentage of loss in transmission. The plant operated 24 hours daily, with peak hours from 2000-2200 hours in summer, and 2000-2300 hours in winter.

Equipment

8. The TETs No. 1 plant was equipped with five boilers: two were old [] models, type unknown, one of which was for reserve use only; three were Soviet make "Taganrog" boilers, each of 175 ton/hour capacity, eight meters long, 10-12 meters deep (sic), about 27 meters in height, built to withstand a pressure of 90-100 atmospheres at 500 degrees centigrade. There were four turbines: two were captured [] steam turbines, each of 12,000 kilowatt capacity, installed in 1948 or later. Each of the [] turbines had one boiler. The third turbine, installed in 1954-1955 was a 25,000 kilowatt Soviet make steam turbine, manufactured by the Sverdlov Plant, and the fourth turbine, installed in 1956, was a Soviet make 25,000 kilowatt steam turbine, manufactured by the Leningrad Metal Plant. Each of these turbines was serviced by one boiler. The average output of these boilers was 80-85 percent maximum capacity. Each turbine had a separate generator of the same capacity as the respective turbine: "Siemens-Schukert" for the [] turbines, and "Elektrosil" generators for the Soviet turbines. The respective transformers were also of the same manufacture as the generators.

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TETs No. 2

9. This plant, located within the territory of the machinery-railroad car construction plant, supplied power only to the above-mentioned plant, and was subordinate to a ministry of machine building (sic).

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the machinery-railroad car construction plant was a restricted armament plant. This station had a maximum capacity of 24,000 kilowatts per hour. The fuel was coal, requiring approximately 300 grams of fuel to produce one kilowatt (depending upon the quality of coal). The plant employed about 150 people.

10. TETs No. 2 had two boilers which were products of a new Soviet boiler plant (name, location unrecalled). These boilers had a capacity of 75-90 ton/hours at a pressure of 20-25 atmospheres and temperature of 400 degrees centigrade, and were about eight meters in length, 12 meters in depth (sic) and 25 meters in height. The installation of one boiler was completed in October 1956.

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work on the installation of the second boiler was still in progress. The plant had two "Skoda" steam turbines, each of 12,000 kilowatts maximum capacity, at a pressure of 30 atmospheres, each fed by one boiler. They were installed in fall of 1956. Each turbine had a "Skoda" generator, of 12,000 kilowatt maximum output. Soviet made transformers, type "Elektrosil" were used for the Czech turbines, one for each turbine.

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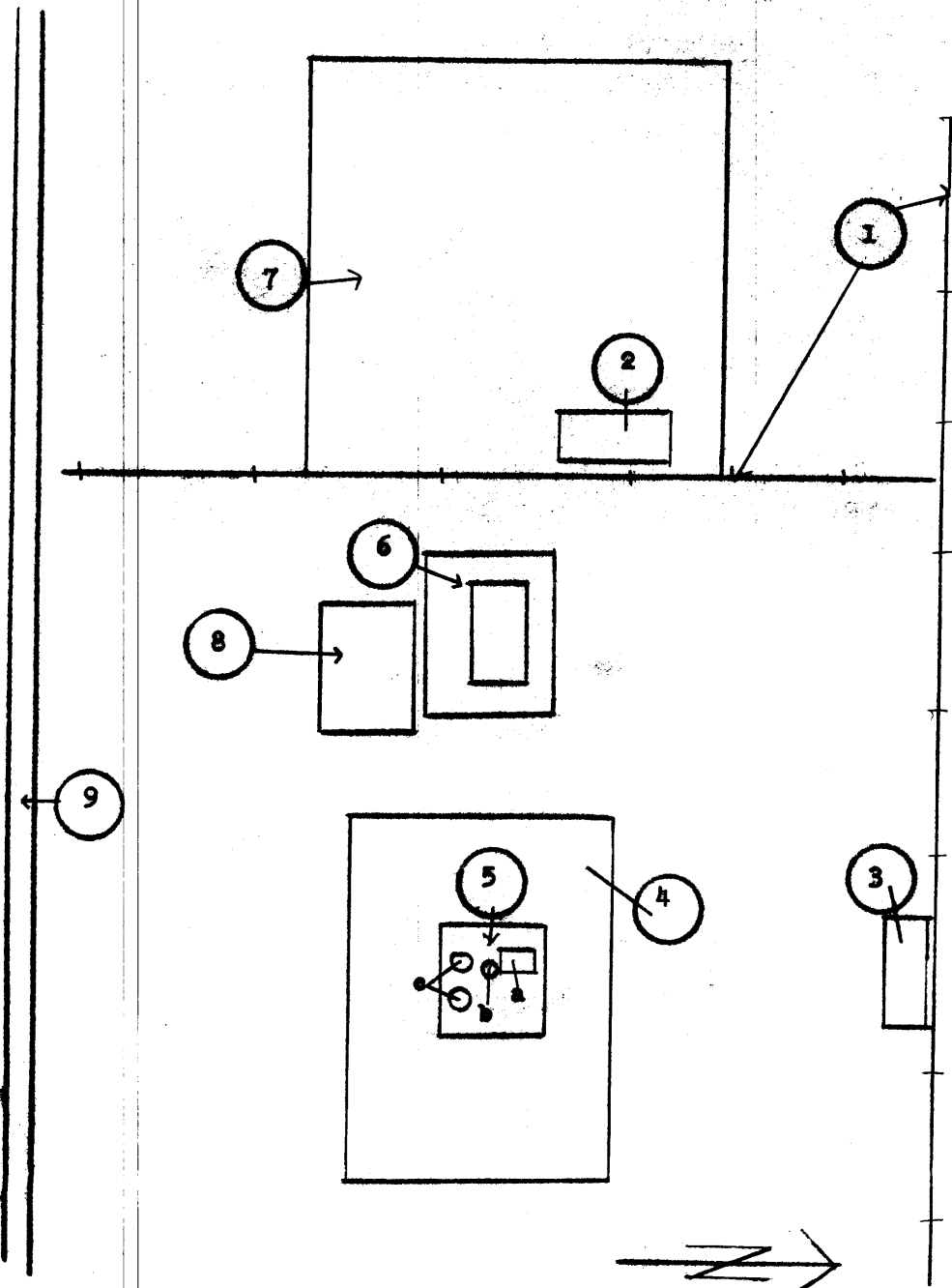
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Location of Penna
Power Plants. (not to scale)

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COUNTRY: USSR (Moskovskaya oblast) REPORT NO.:

SUBJECT: Stupino Power Plant

DATE OF REPORT: 29 July 1960

STUPINO POWER PLANT

1. [redacted] a new 50,000 kilowatt steam turbine in the Stupino Power Plant (TETs) in 1953 or 1954, and a 100,000 kilowatt steam turbine in the same plant in 1955. [redacted] this power plant, constructed in or about 1948, originally was installed to service the Stupino Aviation Plant, but in 1953 or 1954 was united with the Moscow Power System. The power station [redacted] was not considered a restricted plant. Up to 1953 or 1954 the power plant was subordinate to the Ministry of Aviation Industry, but afterwards it was transferred to the Ministry of Electric Power Stations.

Power Plant Location

2. Refer to page 5, [redacted] sketch of the location of the Stupino TETs plant and installations. The following legend identifies numerical designations:

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- (1) Moscow-Stupino railroad line (reference point).
- (2) Highway.
- (3) Highway.
- (4) Stupino Aviation Plant.
- (5) Stupino Power Plant, about one and one-half kilometers south of the railroad line. This was a fenced-off area about one by one-half kilometers in dimension.
 - a. Machine shop, a one-story brick building, 50 x 25 meters in area dimension.
 - b. Cooling basin, about 10 meters square, three meters deep. This basin held water from the Oka River.
 - c. Open area for transformers and insulators.
 - d. Sub-station, 25 x 12 meters in area dimension.
 - e. Turbine and boiler station, 200 x 80 meters in area dimension.
 - f. Three smokestacks, each 10 meters in diameter, 120 meters in height.
 - g. Gates.
- (6) TETs administration building.
- (7) Highway.
- (8) Town of Stupino.

Output

3. The total installed maximum capacity (sic) of the power plant was 250,000 kilowatts per hour. Prior to 1953 this output capacity was 100,000 kilowatts per hour, but in 1953 a new 50,000 kilowatt turbine was installed, and in 1955 a 100,000 kilowatt turbine was installed. The steam turbines utilized

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coal as fuel. The fuel consumption varied according to the quality of the coal, but the average amount consumed was 300 grams for the output of one kilowatt. The Stupino Power Plant had about 500 employees in 1956.

Production Costs

4. In 1956 the cost of electric power produced per kilowatt hour was seven and one-half kopeyki (0.075 rubles). The power plant charged a sales price of nine kopeyki (0.09 rubles) to the Moscow Power System per kilowatt hour, and the system, in turn, charged consumers 11 kopeyki (0.11 rubles) per kilowatt hour. In 1948 the initial sales price was 13 kopeyki; in 1950, 12 or 11 kopeyki; in 1953 it was 10 kopeyki; and it was envisaged that the sales price would be reduced to seven-seven and one-half kopeyki by 1960. The base cost in 1956 was estimated in the following percentages: fuel - 40 percent; amortization - 20 percent (figured on 20 years); personnel, wages - 10 percent; materials - 20 percent; water cooling, transmission lines, miscellaneous - 10 percent. The heavy equipment was purchased by the power plant

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Operating Efficiency Data

5. The coefficient of efficiency for the entire power plant was 30-34 percent; for the turbines - 85 percent; for the boilers - 89-94 percent; and for the generator - 85 percent. The economical overall output was 82 percent. About one-half to one percent was estimated average percentage of loss in transmission. The plant operated 24 hours daily, with peak hours from 2000-2200 hours in summer, and 2000-2300 hours in winter. The Stupino Power Plant current was distributed at 50 kilovolts. While this plant fed the Moscow Power System, its output could be changed to supply only the Stupino Aviation Plant.

Equipment

6. In 1955 the Stupino Power Plant equipment included seven boilers (coal fueled). The plant had two [] boilers [] of 100-125 ton/hour capacity, at a pressure of 80 atmospheres, installed in 1947-1949. One of these boilers was for reserve emergency use only. Two boilers (Taganrog) were

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of 175 ton/hour capacity at a pressure of 80-100 atmospheres. Three boilers (Taganrog) were of 275 ton/hour capacity which operated under a high pressure of 120 atmospheres. These latter boilers were each 30-35 meters in height, 10-12 meters in length, about 20 meters in depth (sic) and weighed about 400 tons. All of the boilers operated at 500 degrees centigrade. There was one [redacted] 7,000 kilowatt turbine which operated at a pressure of 80-87 atmospheres, installed in 1947-1949, for reserve use. The five operative turbines included one [redacted] 25,000 kilowatt turbine (100-120 atmospheres), installed in 1947-1949; one [redacted] 25,000 kilowatt turbine (100-120 atmospheres), installed in 1948-1950; one IMZ (Leningrad Metal Plant) 50,000 kilowatt turbine, (90-100 atmospheres), installed in 1951-1952, and another identical unit installed [redacted] in 1953-1954; and one IMZ 100,000 kilowatt (pressurization of 90-100 atmospheres), weight about 200 tons, installed [redacted] in 1955. The latter model required two boilers, whereas the 25,000 kilowatt and 50,000 kilowatt turbines each required only one boiler. The [redacted] turbines had [redacted] generators, and the Soviet make turbines had "Elektrosil" generators. The maximum capacity of each generator was the same as that of the turbine to which it was connected, and the normal output was about 85 percent capacity. [redacted]

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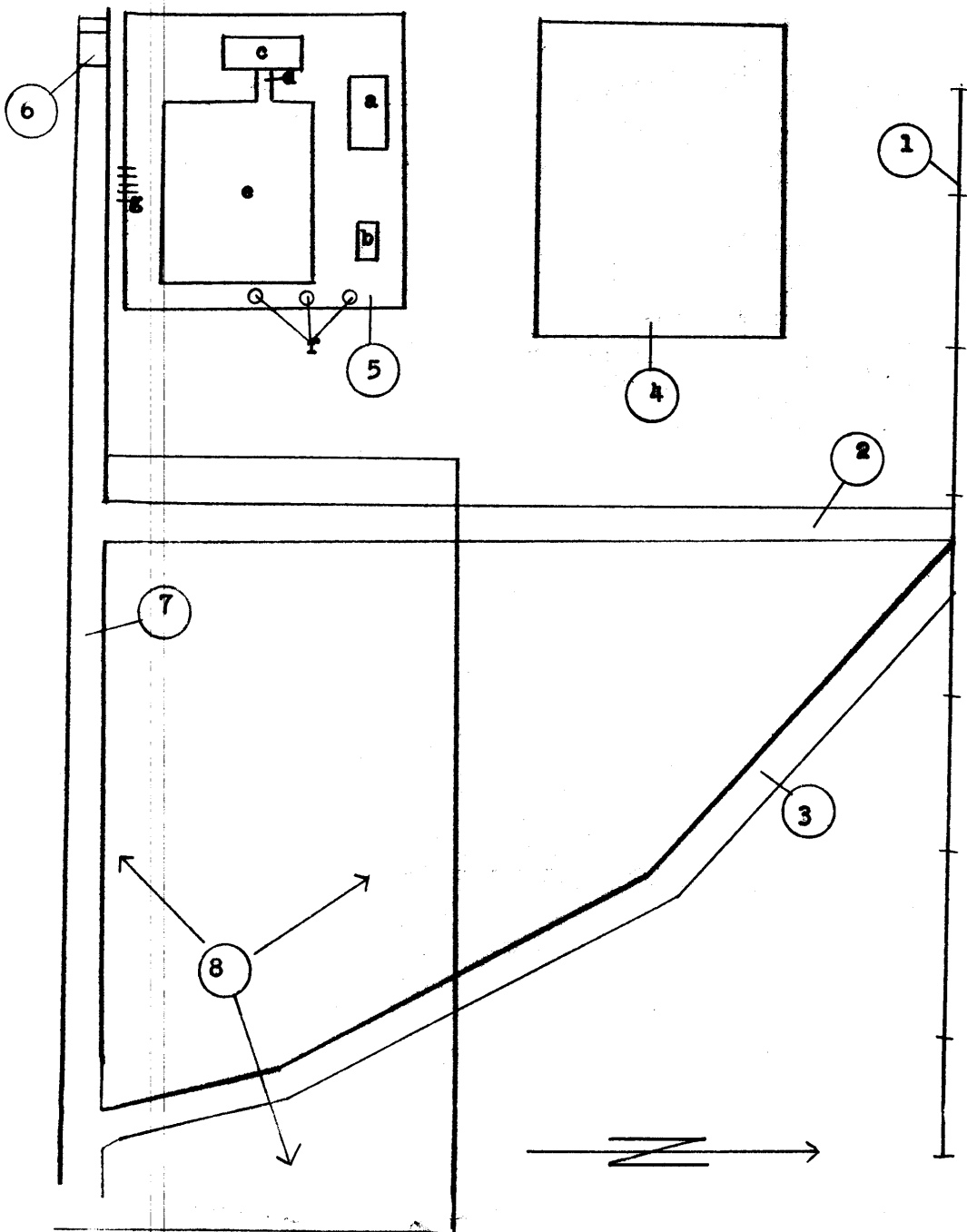
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Sketch of the Location
of the Stupine Power Plant
(not to scale)



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COUNTRY: USSR (Dnepropetrovskaya
SUBJECT: oblast and Zaporozhskaya
oblast)

REPORT

Dnepropetrovsk Power Plant

PLACE ACQUIRED:

DATE OF REPORT: 28 July 1960

DNEPROPETROVSK POWER PLANT

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1. In 1954/1955 [redacted] installation of a 100,000 kilowatt steam turbine in the Dnepropetrovsk Power plant. This power plant was located six or seven kilometers north of the Dnepr River, near a meat and sausage factory and a rolling mill.

2. Refer to page 5 [redacted] sketch of approximate location of the Dnepropetrovsk Power Plant:

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(1) Metal Rolling Mill. (Reference point)

(2) Power plant. The plant area was about one and one-half by one-two kilometers in size. [redacted]

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(3) Settlement for power plant employees.

(4) Meat and sausage factory.

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(5) Bridge over Dnepr River.

(6) Dnepr River.

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(7) Dnepropetrovsk

Output

3. The plant was subordinate to the Ministry of Electric Power Stations. It was constructed in or about 1950 or 1951, and was transferred in or about 1954-1955 from the TsentroEnergMontazhTrest to the Donbass Trest. The plant's power output fed directly into the Donbass system. Prior to 1954, the power plant's maximum capacity was 400,000 kilowatts per hour. In 1954/1955 a new 100,000 kilowatt capacity steam turbine, raising the maximum capacity to 500,000 kilowatts per hour. It was planned to install two additional steam turbines, each of 100,000 kilowatts, in 1956-1957 thus increasing the maximum capacity to 700,000 kilowatts per hour. The fuel used was coal, requiring about 300 grams of fuel to produce one kilowatt of power (depending upon the quality of the coal). The Dnepropetrovsk Power Plant employed about 250 workers.

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Production Costs

4. In 1954 the cost of electric power produced per kilowatt hour was about eight kopeyki (0.08 rubles). The power plant charged a sales price of 10 kopeyki (0.10 rubles) to the Donbass Power System for a kilowatt hour, and the system, in turn, charged consumers 12 kopeyki per kilowatt hour. The base cost in 1954 was broken down into: fuel - 40 percent; amortization - 20 percent (figured on 20 years); personnel, wages - 10 percent; materials - 20 percent; water cooling, transmission lines, miscellaneous - 10 percent.

the power plant bought all equipment, and the TsentroEnergMontazhTrest only was concerned with installation. Installation costs were very complex, and the Trust had a book of many cost tables and charts for various steps of installation, such as for pipe, cooling systems, auxiliary equipment, boilers, generators, and transformers. Roughly, it cost two and one-half million rubles to install a complete power plant

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consisting of one 100,000 kilowatt turbine, two 275 ton-hour boilers, with the pertinent generator, transformer and other auxiliary equipment. The 2,500,000 rubles were subdivided into the following cost factor percentages: wages - 22 percent; materials (not including the turbine, boilers, or generator) such as pipe, steel sheet, assembly mechanism, auxiliary material - 60 percent; profit charged by the Trust - 18 percent. The installation of a 100,000 kilowatt turbine (not including boilers, generators, or auxiliary equipment) cost about 400,000 rubles.

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Operational Data

5. The coefficient of efficiency (koefitsient poleznogo deystviya) was 30-34 percent for the entire power plant: for the turbine - 85 percent; for the boilers - 89-94 percent; for the generator - 85percent. The economical overall output of a possible 100 percent maximum was 82 percent. About one-half to one percent was the estimated average percentage of loss in transmission. The plant operated 24 hours daily, with peak hours from 2000-2200 hours in summer, and 2000-2300 hours in winter. The current was distributed at 50 kilovolts.

Salaries of Plant Personnel

6. The average monthly salaries for power plant employees were (with premiums): engineer, 2,500 rubles; production chiefs, 1,200-1,400 rubles; technicians, 1,500 rubles; foremen, 1,200-1,300 rubles; qualified electricians, pipelayers, machinists, turbine and boiler mechanics, 1,000 rubles; and unskilled assistants, 400-600 rubles.

Equipment

7. In 1954 the Dnepropetrovsk Power Plant had ten boilers, of Soviet make (Taganrog), 275 ton-hour capacity pressurized to 120 atmospheres. These boilers were 30-35 meters in height, 10-12 meters in length, and about 20 meters in depth (sic), and weighed about 400 tons. They operated at 500 degrees centigrade. Two boilers were installed in 1954/1955, whereas the other eight were installed in 1951-1954. There were

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five Soviet make (LMZ) 100,000 kilowatt steam turbines, pressurized to 90-100 atmospheres. Each turbine had two rotors. The weight of a turbine was about 200 tons. Four turbines were installed in 1951-1954, and the fifth turbine was [redacted] in 1954/1955. Each turbine had its own generator, type "Elektrosil." The maximum capacity of each generator was the same as that of the turbine to which it was connected, with the normal output about 85 percent capacity. Each turbine had its own transformer, type "Elektrosil."

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Zaporozhye Station

8.

[redacted]

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[redacted] The automatization regulator on a 50.000 LMZ steam turbine did not function properly [redacted]

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[redacted] the automatization regulator was repaired, [redacted]

[redacted] the steam turbine operated efficiently.

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[redacted] the Zaporozhye Power Plant had three or four other Soviet make (LMZ) 50.000 kilowatt steam turbines.

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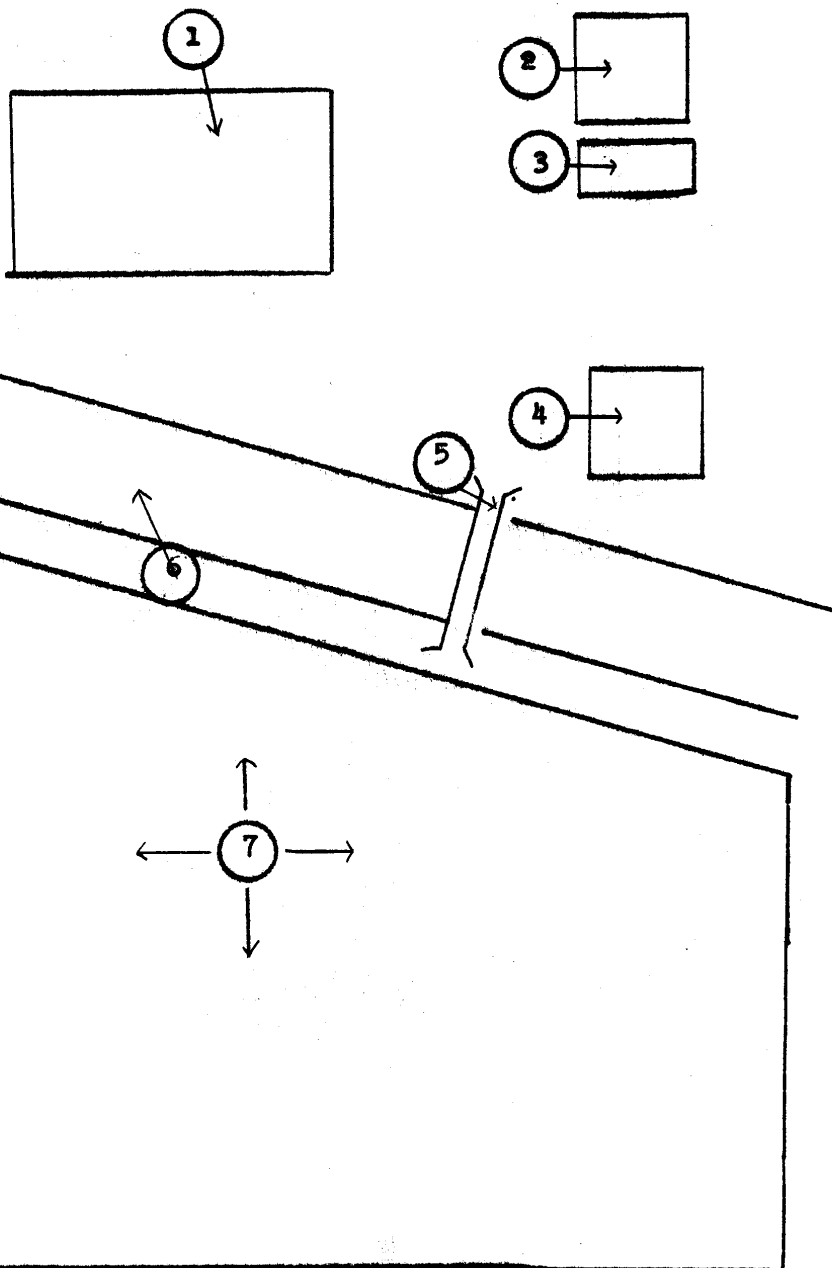
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Sketch of the Location
of the Dnepropetrovsk Power Plant
(not to scale)

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